## REMARKS

Examiner's Rejections and Objections

The Amendment and remarks which follow are responsive to the Office Action mailed August 7, 2002. In that Office Action, Claims 16-25 were rejected under 35 USC § 112, first paragraph, based on a view that the specification as filed did not provide a written description of the invention as claimed in independent Claims 16 and 20. Claims 16-25 were further rejected under 35 USC § 112, second paragraph, based on a view that Claims 16-25 failed to provide guidelines as to the meaning of "high."

Applicants' response to the Examiner's rejections

In response to the Examiner's rejections of Claims 16-25, Applicants have amended the same as indicated above. Applicants will discuss in detail the basis for the proposed amendment to the claim language and the claim language as pointed out by the Examiner in the Office Action.

Claims 16 and 20 both claim a metal structure and a metal curing fixture, respectively, "for forming an acid-containing part into a desired shape." The basis for the proposed amendment is found within the specification. In particular, the specification states "in certain applications it is necessary to provide a substantially acid-impervious metal substrate that comes into contact with another substrate whose chemical acidity acts to leach any available iron from the metal substrate."[1] Additionally, the specification states "resin-impregnated fiber of polymer composite material is placed on a steel curing fixture to give parts made therefrom a desired shape."[2]

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[1] Col. 1, lns. 19-22.

[2] Col. 1, lns. 24-27.

Claims 16 and 20 both claim a metal structure and a metal curing fixture, respectively, comprising a steel surface having deposited thereon an adhesive mixture ... "to adhere the particulate to the steel surface." The basis for the proposed amendment is found within the specification. In particular, the specification states "the method comprises first placing the surface in a field of treatment, then depositing a mixture of a high-temperature acid-impervious[3] polymer particulate such as polyamide particulate and a curable powder adhesive on the surface, and finally subjecting the surface-coated metal substrate to a curing treatment sufficient to cure the powder adhesive and thereby adhere the polymer particulate as a film on the surface."[4]

Claims 16 and 20 both claim a metal structure and a metal curing fixture, respectively, comprising a steel surface having deposited thereon an adhesive mixture of ... particulate and ... adhesive, "the adhesive having a curing temperature lower than a maximum acid-impervious temperature level of the particulate." The basis for the amendment is found within the specification. In particular, the specification states that "the polymer particulate is acid-impervious[5] up to about 700° F, while the powder adhesive in all cases of course cures below the acid-impervious[6] level of

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[3] The specification as filed contained the term "resistant" and not the term "acid impervious." However, during the prosecution of the application, namely in response to the Office Action mailed on December 21, 2000, the term "acid-impervious" replaced the term "resistant." The response was mailed on January 22, 2002. The basis for that amendment was found in the specification. In particular, the specification at Col. 2, lns. 17-23 states that the resultant coating is acid impervious. Since the coating comprises an adhesive and a particulate, the particulate must be the component of the mixture that imparts the acid impervious nature to the coating.

[4] Col. 3, Lns. 6-13.

[5] See supra note 3.

[6] Id.

the polymer particulate."

Claims 16 and 20 both claim a metal structure and a metal curing fixture, respectively, for forming an acid-containing part into a desired shape, the metal structure and the metal curing fixture comprising a steel surface having deposited thereon an adhesive mixture "to mitigate the acid of the part from penetrating therethrough." The basis for the proposed amendment is found within the specification. In particular, the specification states "the acid impervious curing fixture of the present invention allows production of composite parts without the danger of leaching iron from the fixture to thus assure full-utility part fabrication."[7]

As thoroughly demonstrated above, Applicants respectfully submit that the specification of the subject application explicitly and inherently supports the proposed amendment to the language of the claims and the claim languages as identified by the Examiner. In this respect, Applicants believe that no material constituting new matter has been introduced. Therefore, Applicants respectfully request that the Examiner reconsider the proposed amended claims, new claims and their pertaining remarks which are set forth below.

Applicants further respectfully submit that the claim language, specifically, "high curing temperature powder adhesive" is sufficiently definite. In particular, Claims 16 and 20 both claim a metal structure and a metal curing fixture, respectively, comprising a steel surface having deposited thereon an adhesive mixture of... particulate and "a high curing temperature powder adhesive." The guidelines to determine the meaning of "high" is found implicitly within the specification.

In support thereof, a problem identified in the background of the invention pertained to corrosion of steel fixtures when certain high-temperature polymer composite materials that cure

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[7] Col. 3, ln. 25 - Col. 4, ln. 2.

above 500°F are vacuum bagged to the steel fixture and cured above such temperatures.[8] This provides the lower range of "high" because adhesives with curing temperatures below 500°F would not solve the problem identified in the background of the invention. The upper range of "high" is found within the specification, namely, the statement that the adhesive cures below about 650°F. Hence, the specification implicitly and explicitly defines the term "high."

Applicants will now discuss the reasons that the invention claimed in Claims 16 and 20 are believed to be novel and non-obvious. In particular, one or more elements of the elements in Claims 16 and 20 are not disclosed and not made obvious in view of the cited prior art, namely, Sagawa et al. (U.S. Patent No. 5,505,990) and Millar et al. (U.S. Patent No. 4,027,366).

In particular, Claims 16 and 20 recites a "high curing temperature powder adhesive." Sagawa et al. does not disclose a high curing temperature powder adhesive in two aspects, specifically, "high curing temperature" and "powder." In relation to the first aspect, Sagawa et al. does not disclose the "high"[9] characteristic of the adhesive. The experimental results discussed in Sagawa et al. states temperatures below 500°F, generally, curing temperature ranges below 463°F (180°C). (See, Example 1 – 170°C; Example 2 – 140°C to 180°C; Example 3 – no temperature; Example 4 – 140°C; Example 5 – 150°C; Example 6 – 150°C; Example 7 – 130°C; Example 8 – 150°C, 130°C and 160°C).

Moreover, if the adhesive in Sagawa et al. was chosen to be a high curing temperature powder adhesive, then, as understood, the invention is rendered inoperable for its intended purpose.

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[8] Col. 2, lns. 1-6.

[9] The guidelines defining "high" is discussed above. As such, Applicants will not discuss the reason that "high" is not indefinite.

In support thereof, Sagawa et al. states in its specification that when a structure or fixture is heated excessively then the barrier begins to drop or sag, and roughens the steel surface.[10] In this regard, the modified version of Sagawa et al. would not only be rendered inoperable for its intended purpose but also would not provide a part which has full-utility out of the structure or fixture,[11] based on a view that the rough surface would require that the part be machined after being formed. In this regard, even if a high curing temperature powder adhesive is used with Sagawa et al., the benefits of the present invention will not be realized.

In relation to the second aspect, Sagawa et al. does not disclose an adhesive that is a "powder." As understood, the adhesive disclosed in Sagawa et al. are resins[12] which are not powders but connote more of a fluid characteristic.[13]

Furthermore, if powder adhesives were utilized in the invention disclosed in Sagawa et al., then the invention, as understood, would be inoperable. In particular, as understood, the basis of the invention disclosed in Sagawa et al. is that an adhesive coating is formed on the part then the particulate is added to the surface of the adhesive then a third element, namely, a media, impacts the

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[10] Col. 6, Lns. 1-5.

[11] In the Summary of the Invention of the present invention, the specification states that the structure or fixture "allows production of composite parts without the danger of leaching iron from the fixture to thus assure full-utility parts fabrication." (Col. 3, ln. 26 – Col. 4, ln. 2).

[12] Resin defined: 1. Any of numerous clear to translucent yellow or brown, solid or semisolid, viscous substances of plant origin, such as copal, rosin, and amber, used principally in lacquers, varnishes, inks, adhesives, synthetic plastics, and pharmaceuticals. 2. Any of numerous physically similar polymerized synthetics or chemically modified natural resins including thermoplastic materials such as polyvinyl, polystyrene, and polyethylene and thermosetting materials such as polyesters, epoxies, and silicones that are used with fillers, stabilizers, pigments, and other components to form plastics. THE AMERICAN HERITAGE DICTIONARY (Second College ed. 1982) (emphasis added).

[13] Viscosity being a characteristic of fluids.

particulate into the adhesive coating.[14] If the adhesive was a powder then the media would not impact the particulate into the adhesive residing on the part; rather, the media would impact the particulate into the part itself, assuming that the part is softer than the particulate.

Claims 16 and 20, as amended, further recite that the barrier is effective as "an acid impervious barrier at temperatures above 500°F." For the reasons discussed above in relation to the "high" temperature characteristic of the adhesive, Sagawa et al. does not disclose, suggest, or make obvious a barrier which is effective at temperatures above 500°F.

Additionally, Sagawa et al. does not disclose the acid impervious characteristic of the barrier. In this regard, Sagawa et al. does not also disclose an adhesive mixture which "mitigate[s] the acid of the part from penetrating [the barrier]." Rather, Sagawa et al. is simply directed to fabricating industrial barriers that behave as coating for parts and products. Applicants submit that no where in Sagawa et al. is there even a slight reference to making its coatings for the purpose of preventing acid contents of a part from penetrating through the barrier or a barrier which has an acid impervious characteristic.

Claims 16 and 20 recite that the adhesive mixture adheres "the particulate to the steel surface." As understood, Sagawa et al. does not disclose a mixture of adhesive and particulate to adhere the particulate to the steel surface. Instead, as understood, the particulate of Sagawa et al. requires the additional impact of a media which drives the particulate into the adhesive.[15] Without the media, as understood, the particulate would not be completely adhered to the adhesive. As discussed above, the media drives the particulate to lodge the particulate inside of the adhesive. Hence, the particulate, as understood, would dislodge from the adhesive without the media.

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[14] Sagawa et al., Col. 3, lns. 60-65.

[15] Col. 3, lns. 60-65.

Claims 16 and 20 further recite "the adhesive having a curing temperature lower than a maximum acid-impervious temperature level of the particulate." As discussed above, the disclosure of Sagawa et al. does not contemplate any acid impervious characteristic in the barrier. In that regard, the disclosure of Sagawa et al. does not motivate or suggest to one of ordinary skill in the art the relationship between curing temperature and maximum acid-impervious temperature level. As such, Sagawa et al. does not disclose, suggest, or make obvious the invention claimed in Claims 16 and 20.

A discussion of the reasons that Claims 16 and 20 are believed to be novel and non-obvious in view of Millar et al. will follow. In particular, Claims 16 and 20 recites a mixture of an acid-impervious polymer particulate and high curing temperature powder adhesive. Millar et al. does not disclose a particulate and a powder having these characteristics, namely, acid-impervious polymer and high curing temperature adhesive, respectively, which make up a mixture.

Furthermore, Millar et al., as understood, teaches away from using an adhesive powder as one of the components of the mixture. In particular, as understood, Millar et al. discloses that the components are electrostatically deposited on the steel surface and that a subsequent curing forms an integral coating. In this regard, the adherence of the mixture to the steel surface is accounted for first by the electrostatic charge, then by the fusing of the mixture together[16]. As such, there is no need for an adhesive in the invention disclosed in Millar et al. and the adhesive would not serve any

[16] As understood, the mixture when undergoing electrostatic deposition is attracted to the steel surface globally and not merely locally. In this regard, the mixture after being cured is retained on the steel surface due to the mixture being fused together to form a single barrier completely around the steel surface and not due to any adhesive properties of the mixture. This is similar to a gift box being wrapped. Although the wrapping paper does not adhere directly to the gift box, the physical encapsulation of the gift box by the wrapping paper retains the wrapping paper on the gift box.

functional purpose. Hence, Millar et al. does not motivate, suggest or make obvious the adhesive powder component of the mixture.

Millar et al. does not disclose a powder adhesive having a high curing temperature. In support thereof, the curing temperatures in examples 1-8 of Millar et al. are notably below 500°F, specifically, examples 1-8 discloses temperatures below 420°F. Applicants recognize that Millar et al. broadly states that the curing temperature may range from 140°F to 1500°F. However, Applicants respectfully submit that such language does not provide an enabling disclosure as to the workable curing temperatures, particularly, with respect to the actual conducted experiments shown in its examples.

As understood, Applicants cannot find any disclosure in Millar et al. as to fabricating a barrier with the characteristic of being acid-impervious. More specifically, Millar et al. does not disclose a particulate being an acid-impervious polymer. Furthermore, as understood, the disclosure of Millar et al. does not disclose any suggestion or motivation to one of ordinary skill in the art to modify the invention disclosed in Millar et al. such that one of the components has the characteristic of being an acid-impervious polymer.

Claims 16 and 20 recite that "the adhesive [has] a curing temperature lower than a maximum acid-impervious temperature level of the particulate." As understood, Millar et al. does not disclose such a temperature relationship between the adhesive and particulate. The disclosure appears to be absent any relationship between the temperature characteristics of each component within the mixture.[17]

[17] Col. 4, lns. 17-26. As understood, the invention disclosed in Millar et al. appears directed to the relationship between dielectric charge, chargeability and specific gravity, and the methods of depositing material on a substrate to create either stratified layers of different materials wherein each layer consists of one or more materials.

Furthermore, Millar et al. teaches away from such a mixture. In support thereof, Millar et al. states that a mixture of two components, as understood, is possible if the specific gravities of the two components are similar.[18] In the present invention, the adhesive powder generally has a different specific gravity compared to the particulate.[19] As such, if the claimed mixture was electrostatically deposited onto the steel surface and subjected to a curing process, the resultant barrier would not be a mixture as recited in Claims 16 and 20 but two stratified layers as disclosed in Millar et al.[20] Hence, one is taught away from making the claimed invention based on a view that the modification to Millar et al. would not make a mixture but would rather make two stratified layers.

Claims 16 and 20, as amended, further recite that the barrier is effective as an acid impervious barrier at temperatures "above 500°F." For the same reasons discussed above in relation to the "high" temperature characteristic of the adhesive, Millar et al. does not disclose, suggest or make obvious a barrier which is effective at temperatures above 500°F.

For the foregoing reasons, Applicants respectfully submit that Claims 16 and 20 are novel and non-obvious. Hence, Applicants respectfully submit that Claims 16, 20 and their dependent claims are believed to be allowable.

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[18] As understood, Millar et al. teaches that the components are electrostatically deposited in layers on the steel surface based on its ability to carry a charge. Once the components are electrostatically deposited on the steel surface, then the components may rearrange themselves based on its specific gravity when in the curing phase. As such, if two components have two substantially different specific gravities then they will separate during the curing phase. Col. 4, lns. 4-8, lns. 14-16.

[19] Generally, there is a relationship between a component's melting temperature and specific gravity in that components with higher specific gravity requires more energy or a higher temperature to break the bonds to effect a physical change within the component. In the present invention, the powder adhesive cures at a temperature lower than the temperature at which the particulate changes its physical characteristic, namely it acid-impervious characteristic. As such, generally, the powder adhesive would have a lower specific gravity than the acid impervious particulate.

[20] Col. 3, ln. 64 – Col. 4, ln. 8.

Applicants have additionally added new independent Claim 26 and its dependent claims 27-36. Independent Claim 26 and its dependent Claims 27-30 are based on independent Claims 16 and 20. In this regard, the basis and the reasons for which Applicants believe that Claims 26-30 are in condition for allowance track the basis and the reasons discussed in relation to Claims 16 and 20. In this regard, Applicants respectfully submit that Claims 26-30 are believed to be novel and non-obvious for the reasons stated above.

In relation to Claims 31-36, the same are believed to contain additional patentable subject matter. For example, in Claim 31, the same recites that "the mixture is operative to form an acid-impervious barrier above a leaching temperature of the part." The basis for which is found within the specification. Specifically, the specification states that "certain high-temperature polymer composite materials that cure above about 500°F will corrode the steel fixture while contemporaneously producing a bad part that exhibits undesirable reduced oxidative properties and high porosity."[21] Additionally, the specification states that "the acid-impervious curing fixture of the present invention allows production of composite parts without the danger of leaching iron from the fixture to thus assure full-utility part fabrication."[22] In this regard, for certain high-temperature polymer composite materials, the leaching temperature is defined as the temperature at which the steel fixture is corroded while contemporaneously producing a bad part that exhibits undesirable reduced oxidative properties and high porosity.

[21] Col. 2, lns. 3-6.
[22] Col. 3, ln. 25 - Col. 4, ln. 2.

The disclosures of Sagawa et al. and Millar et al. do not disclose a relationship between temperature, and its leaching effects on the fixture and its part and its effect on the part.[23] As such, Applicants respectfully submit that the disclosures of Sagawa et al. and Millar et al. do not disclose, suggest or make obvious the invention claimed in Claims 31-36. Hence, Claims 31-36 are believed to be in condition for allowance.

Request for Allowance

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

On the basis of the foregoing, Applicants respectfully submit that all the stated grounds of rejections have been overcome, and that Claims 16-25 and new Claims 26-36 are in condition for allowance. Entry of the proposed amendment and new claims, and an early Notice of Allowance is therefore respectfully requested.

Should the Examiner have any suggestions for expediting allowance of the application, the Examiner is invited to contact Applicant's representative at the telephone number listed below.

[23] In relation to Millar et al., see note 17. In relation to Sagawa et al., as discussed above in relation to "acid-impervious" nature of the barrier, Applicant has stated that, as understood, Sagawa et al. is simply directed to fabricating industrial barriers that behave as coating for parts and products.

Should any additional fees be required, please charge Deposit Account Number 19-4330.

Respectfully submitted,

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Version With Markings To Show Changes Made

IN THE CLAIMS:

Please amend the following claims:

16. (Thrice Amended) A metal structure for forming an acid-containing part into a desired shape, the metal structure comprising [an acid containing] a steel surface having deposited thereon an adhesive mixture of an acid-impervious polymer particulate and a high curing temperature powder adhesive to adhere the particulate to the steel surface, the adhesive having a curing temperature lower than a [melting] maximum acid-impervious temperature level of [said] the particulate [to adhere said particulate to the steel surface after deposition of said mixture on the steel surface], the adhesive mixture being operative to form an acid-impervious barrier at temperatures above 500°F to mitigate the acid of the [steel surface] part from penetrating therethrough.

20. (Thrice Amended) A metal curing fixture for forming an acid-containing part into a desired shape, the metal curing fixture comprising [an acid containing] a steel surface having deposited thereon an adhesive mixture of an acid-impervious polymer particulate and a high curing temperature powder adhesive to adhere the particulate to the steel surface, the adhesive having a curing temperature lower than a [melting] maximum acid-impervious temperature level of [said] the particulate [to adhere said particulate to the steel surface after deposition of said mixture on the steel surface], the adhesive mixture being operative to form an acid-impervious barrier at temperatures above 500°F to mitigate the acid of the [steel surface] part from penetrating therethrough.